EXECUTIVE
MODEL 750
OPERATION
MANUAL

INTERNATIONAL
CRYSTAL MFG. CO. INC.

PACKING SLIP CTZ - 750

This package contains one each of the items listed below. If there is any complaint or shortage, this slip MUST BE RETURNED before any adjustment can be made.

- ✓ Model 750 with Mobile Mount attached
- ✓ Microphone
- ✓ Power Cord Kit
- ✓ Manual
- ✓ Microphone Hanger Bracket, with mounting screws
- ✓ 7 1/2 Amp Fuse
- ✓ RMO Unit
- ✓ 17 Ft. Cable
- ✓ 2- 18 Ft. wires
- ✓ 1- 3 Ft. wire
- ✓ External Speaker Assembly with leads
- ✓ Mobile Mounting Rack, RMO Console

5959 1.3 — Code

PACK. 4 — Packed By

Inspected By

INTERNATIONAL CRYSTAL MFG. CO. INC.
18 N. LEE-OKLAHOMA CITY, OKLAHOMA

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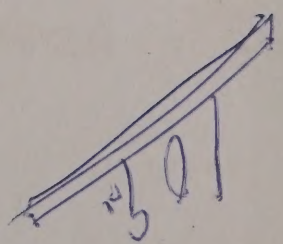


SECTION I

GENERAL

The INTERNATIONAL EXECUTIVE, Model 750 is the latest of the Executive series designed for remote control operation. This Citizens Band unit combines a sensitive and selective dual conversion receiver with a highly stable and efficient crystal controlled transmitter. The transmit and receive frequency selector circuits are housed in the RMO unit.

A frequency synthesizer is provided in the RMO unit for the selection of any one of the 23 citizen band channels. A squelch circuit is built-in to provide receiver quieting during periods when no signal is being received. The crystals supplied have a frequency tolerance of .005% when used in the EXECUTIVE.

The illuminated 12 position CHANNEL selector dial allows the operator to instantly select the desired channel in two ranges. With the HI-LO switch in the LO position channels 1 thru 12 are selected by the CHANNEL selector dial and when placed in the HI position channels 13 thru 23 are selected by the CHANNEL selector dial.

The EXECUTIVE has been designed with flexibility of installation in mind. It may be used in a car, boat, plane or other mobile and portable applications, wherever there is 6 or 12 VDC available. It may be used with a base loaded whip antenna, regular whip, ground plane, beam and other types of antennas. The Model 750 may also be operated from a 115 VAC source. This new Executive Model has been designed primarily for installation in vehicles where space limits the mounting of other models. The RMO console requires limited space and can be mounted in even the smallest of automobiles.

Though the unit is very versatile, it is not to be expected that either receiving or transmitting results will be the same in every installation. As in all radio communications and particularly in VHF applications, the type of antenna, its location above ground, the noise present in the area and other factors are bound to affect the results obtained.

SPECIFICATIONS

Receiver:	
Tuning Range	Crystal Controlled-Any Channel, 1 through 23.
Sensitivity	Usable to .5 microvolts
Selectivity	15 db down at 10 kc 60 db down at 30 kc
Image Rejection	Better than 50 db down
Audio Output	2.5 watts into 4-6 ohms
Speaker Impedance	4-6 ohms
Squelch Range	.5 to 20,000 microvolts. On-off differential is approximately 1 microvolt, at 5 microvolt input
Noise Limiter	Automatic, series-gate
Transmitter:	
Tuning Range	Crystal controlled any channel, 1 through 23.
Frequency Stability	±.005% @ 0° to 125° F, when used with INTERNATIONAL high stability crystals
RF Power Input	5 watts maximum (FCC rules)
Modulation	Capability-100%
Power Consumption:	
Transmitting	65 watts (approximate)
Receiving	60 watts (approximate)
Weight	12 pounds (approximate)
Microphone	High impedance, ceramic or dynamic type with (push-to-talk switch)

RMO CONTROLS

ON-OFF SWITCH

The on-off switch on the VOLUME control operates in the same manner as the original. This control completes or breaks the primary 110 VAC or 6 or 12 VDC circuit to the power supply and is fused in the RMO Unit.

VOLUME

Although the function of this control is the same, the circuit differs from that of the original. With the unit turned on and the RMO control half open the volume control on the Executive is set for normal listening level then the RMO control is used in the normal manner.

SQUELCH

The RMO Squelch Control is used to eliminate background noise when no signal is being received. Upon initial warmup, turn this control fully counter-clockwise until a click is heard. The switch in the squelch control is OFF in this position. To operate, turn squelch control on and fully clockwise. Then slowly turn the control counter-clockwise until the background noise just disappears. Leave the control set at this point. Do not turn the control too far counter-clockwise as this will reduce the receiver performance and weak signals will not be heard.

CHANNEL SELECTOR

The RMO contains an illuminated 12 position channel selector. When used in conjunction with the HI-LO switch this control switches transmit and receive crystals simultaneously to any one of the 23 citizen band channels. CAUTION: With the HI-LO switch in the HI position DO NOT operate the transceiver with the CHANNEL selector dial on the blank button between channels 22 and 23.

HI-LO SWITCH

This control located to the right of the Channel Selector dial selects the transceiver operating frequency range. With the switch in the LO position channels 1 through 12 are selected by the CHANNEL selector. When placed in the HI position channels 13 through 23 are selected by the CHANNEL selector dial. Pilot lamps are automatically switched to illuminate the proper channel indicating button.

CAUTION: With the switch in the HI position DO NOT operate the transceiver with the CHANNEL selector dial set on the blank button between channels 22 and 23. This will result in operation on an unauthorized frequency.

MICROPHONE (Recepticle)

The RMO Microphone connector requires a four-prong lock-on plug which is furnished with the unit as part of the microphone. High impedance crystal or ceramic and dynamic microphones may be used with this transceiver.

INDICATOR LAMPS

RECEIVE INDICATOR

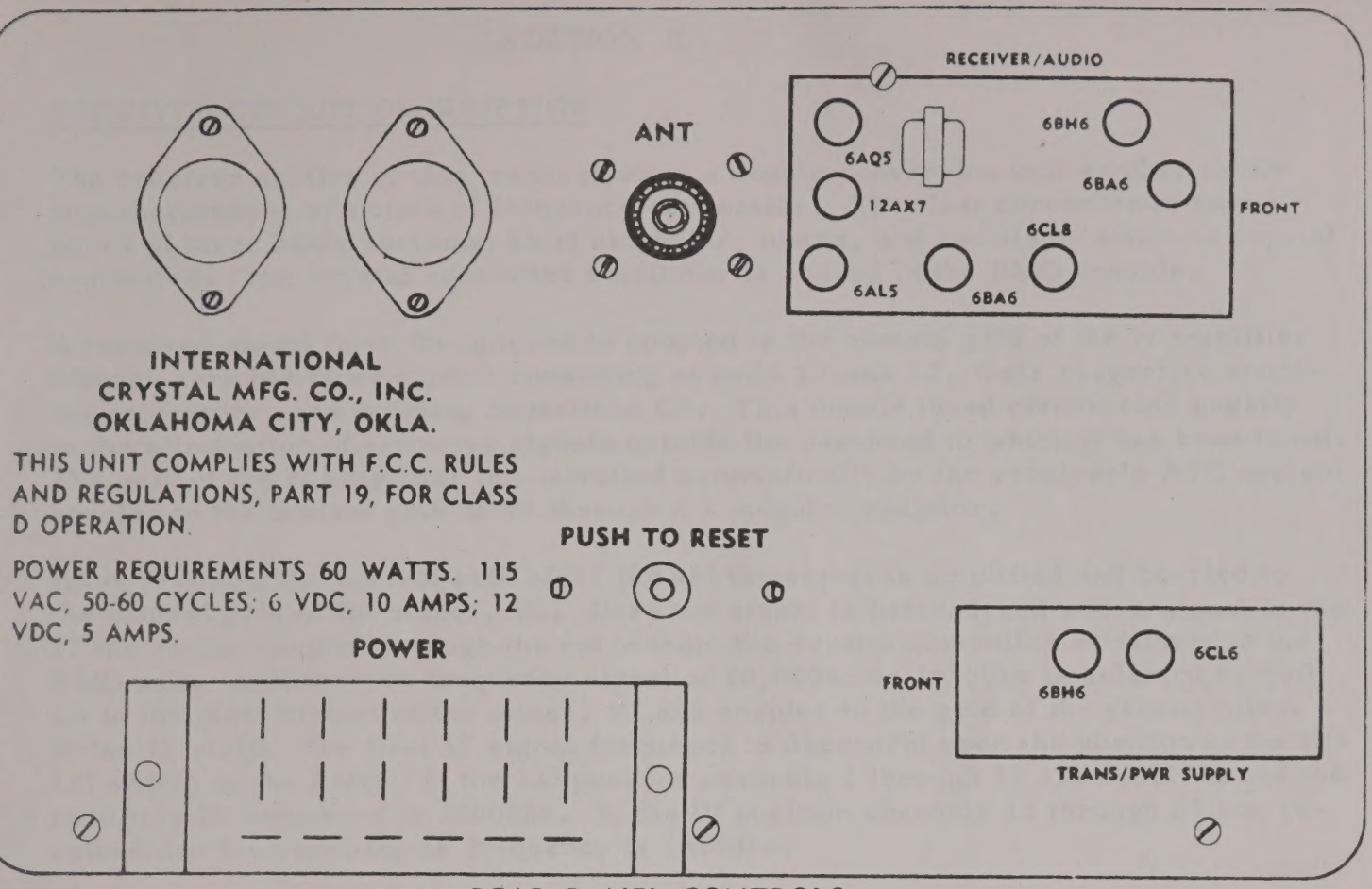
This indicator identified by the letter "R", functions as an on-off (plate voltage) indicator for the receiver section of the transceiver. When the transceiver is operating in Receive position the lamp will glow steadily and go out when the transceiver is placed in the Transmit position.

TRANSMIT INDICATOR

This indicator identified by the letter "T", functions as an on-off (plate voltage) indicator for the transmitter section of the transceiver. When the transceiver is operating in Transmit position the lamp will glow steadily and go out when the microphone button is released and the transceiver returns to receive position.

FUSE

A 15 ampere fuse is installed in the fuse holder and may be changed or replaced, if necessary, by unscrewing the red insert in the center of the holder. If the transceiver is to be operated on 12 volts dc the fuse should be replaced with one having a rating of 7.5 amperes.



REAR PANEL CONTROLS

ANT (Antenna Receptacle)

This receptacle is used to connect the transceiver line to the transmit-receive relay, TR-1. The receptacle is a standard low-loss, VHF type designed for 50-75 ohm coaxial cable.

PUSH TO RESET

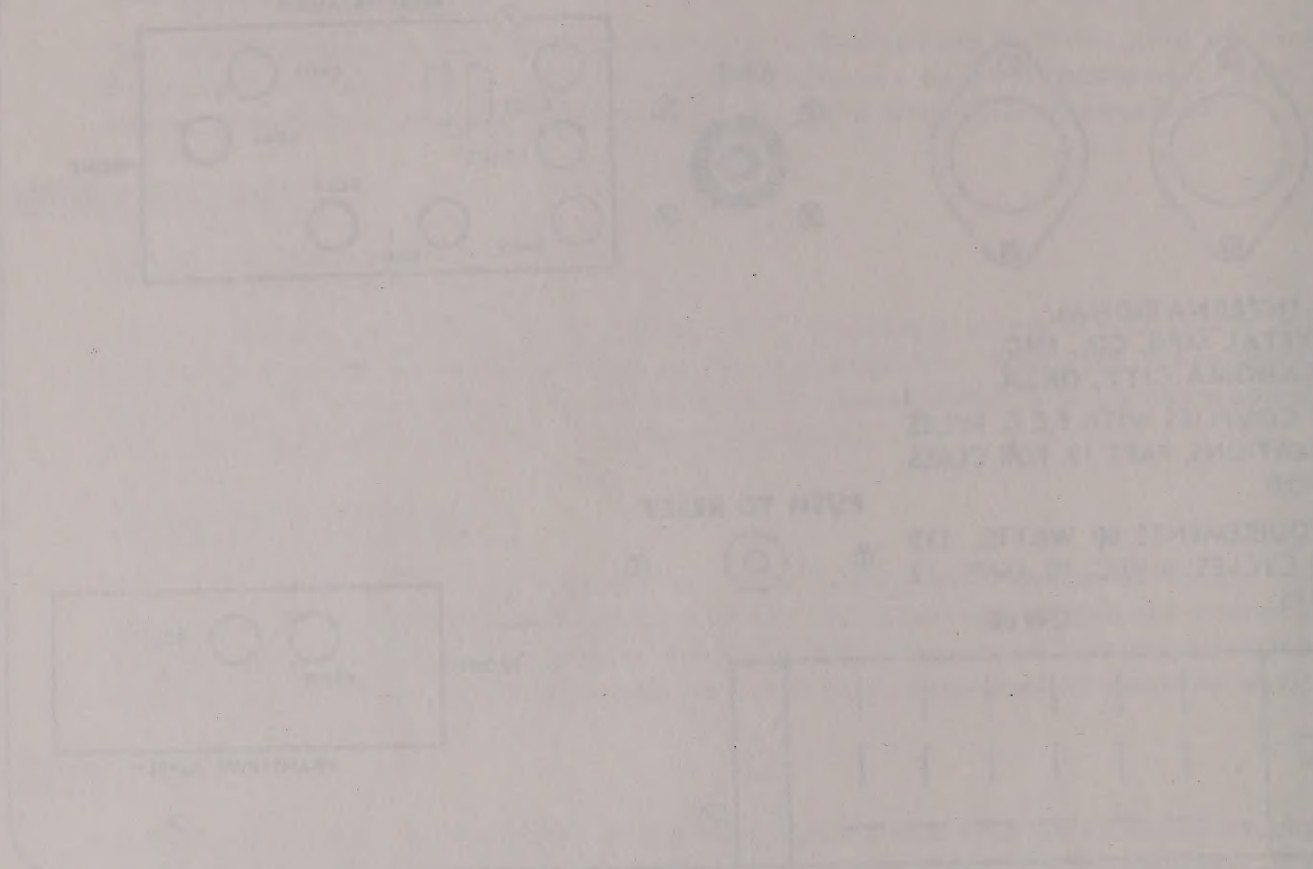
This is a thermal cut-out. It protects the unit when it is being operated on 115 volts ac. If overload causes it to cut out, it can be reset by pressing in on the plunger and holding it in for about two seconds.

POWER

An 18-contact plug is used as a power connector. This allows various input voltages to be used without requiring changes within the unit. All necessary connection changes are made on the external plug. Five different cord assemblies are used; 115VAC, 6VDC negative ground, 6VDC positive ground, 12VDC negative ground, and 12VDC positive ground.

LOCAL-REMOTE SWITCH

The LOCAL-REMOTE switch is located on the terminal bracket inside the transceiver unit. This switch is placed in the REMOTE position when shipped from the factory. This control allows the operator to switch the transmitter on for final tune up from the trunk compartment. After tune up this control must be returned to the REMOTE position.



SECTION II

RECEIVER CIRCUIT DESCRIPTION

The receiver section of this transceiver is a double conversion unit employing the superheterodyne principle of frequency conversion. The first converter is composed of three basic sections; an rf amplifier, mixer, and oscillator which is crystal controlled. The crystal controlled oscillator is housed in the RMO console.

A received signal from the antenna is coupled to the control grid of the rf amplifier through a double tuned circuit consisting of coils L1 and L2, their respective shunting capacitors, and coupling capacitors C3. This double tuned circuit aids greatly in the elimination of unwanted signals outside the passband to which it has been tuned. The gain of the rf amplifier is controlled automatically by the receiver's AVC system coupled to the control grid of V1 through a 1 megohm resistor.

After reaching the control grid of V1 (6BA6) the signal is amplified and coupled to the control grid of the mixer, V2. Here the signal is heterodyned with a signal in the 17 mc region coupled through the cable from the crystal controlled oscillator in the RMO unit. A difference frequency signal of 10,000kc or 10150kc is selected by coil L6 in the plate circuit of the mixer, V2 and coupled to the grid of the second mixer in the IF strip. The first IF signal frequency is dependent upon the position of the HI-LO switch in the RMO. In the LO position channels 1 through 12 are received and the resulting IF frequency is 10000kc. In the HI position channels 13 through 23 are received and the resulting IF frequency is 10150kc.

The second section of the receiver consists of a mixer and crystal controlled oscillator, intermediate frequency amplifier, second detector and noise limiter, and a special squelch circuit.

The 1st IF signal received at the grid of the second mixer, V3A, is heterodyned with a 10455kc or 10605kc signal from the crystal controlled oscillator, V3B. The difference frequency of 455kc is selected in the plate, circuit of V3A and transformer coupled to the control grid of the intermediate frequency amplifier, V4. The gain of this amplifier is also automatically controlled by the AVC system connected to the grid of V4 through the secondary of transformer T1 and a 220 K ohm resistor.

The signal is further amplified in V4 and coupled from the plate through transformer, T2 to the plate of the detector, V5A, where the audio component is detected. V5A is also used to produce the AVC voltage. The detected signal is coupled to V5B which acts as a series-type noise limiter removing noise pulses which may ride through on the signal. The squelch circuit consisting of a neon lamp, NE-1, silicon diode, CR-4 and associated components is connected so that the audio section of the receiver is cut off and background noise eliminated when no signal is being received. The cut-off level may be varied by use of the squelch control.

The third section of the receiver is a conventional audio amplifier consisting of a twin triode audio voltage amplifier, 12AX7 (V6A-V6B) follwed by a 6AQ5 (V7) tetrode power amplifier. When the transceiver is in RECEIVE position only one-half of the 12AX7 is used. The second triode section V6B receives the audio signal from the center tap of the volume control. The audio signal is amplified in V6B whose output is RC coupled to the control grid of the power amplifier, V7. The audio signal is further amplified in V7. The plate of V7 is connected to transformer, T-3, which performs a dual function. In RECEIVE position this transformer acts as a normal output transformer with its secondary connected to the speaker. In TRANSMIT position, its function is that of a modulation transformer.

TRANSMITTER CIRCUIT DESCRIPTION

The transmitter is a multi-stage unit consisting of a crystal controlled frequency synthesizer signal generator located in the RMO console, a buffer amplifier and neutralized tetrode final amplifier.

The frequency synthesizer has 12 channel crystals in the 17 MC range which are selected by the CHANNEL selector switch and two heterodyning crystals in the 10 MC range selected by the HI-LO switch. With the HI-LO switch in the LO position a 10 MC crystal is placed in the grid circuit of the triode section (V12A) of V12. This signal is cathode coupled to the pentode section (V12B) of V12. A 16.965 MC to 17.105 MC(channels 1 thru 12) signal is coupled from the plate of V11 to the control grid of the pentode section of V12. The resulting sum frequencies of 26.965 MC to 27.105 MC (channels 1 thru 12) are selected in the plate circuit of V12B by L26.

The same procedure is followed for channels 13 through 23 except the HI-LO switch is placed in the HI position and a 10.150 MC crystal is switched into the grid circuit of V12A. This signal is heterdyned as before with the 16.965 MC to 17.105 MC signals from V11 and the resulting sum frequencies of 27.115 MC to 27.255 MC (channels 13 through 23) are selected in the plate circuit of V12B by L26. The output of V12B is inductively coupled through the cable to the grid coil L14 of buffer amplifier V9. Buffer amplifier V9 is also inductively coupled to the grid coil of final amplifier V10. The plate circuit of V10 is a shunt-fed pi matching network. Neutralization is accomplished by capacitor C83, and link coil L20 coupled to the cold end of Coil L19.

POWER SUPPLY CIRCUIT DESCRIPTION

A three-way supply is used in this transceiver. It operates as a conventional, full-wave rectifier circuit on all voltage inputs followed by a capacitor input RC filter network. On 6 or 12 volt battery operation, a transistor oscillator circuit is used to provide the necessary AC voltage for the primary circuit of the power transformer.

The transceiver is supplied with a DC power cord kit. The unit may be operated either from 6 volt positive ground, 6 volt negative ground, 12 volt positive ground, or 12 volt negative ground by use of the proper power cord connections. The power supply is equipped with a thermal circuit breaker for protection on AC operation. For protection on 12 volt DC operation a 7.5 ampere fuse is used with the transceiver. Protection on 6 volt DC operation is provided by a 15 ampere fuse which is supplied with the unit. When 12 volt DC operation is desired the 7.5 ampere fuse must be substituted for the 15 ampere fuse.

TRANSMIT-RECEIVE RELAY CIRCUIT DESCRIPTION

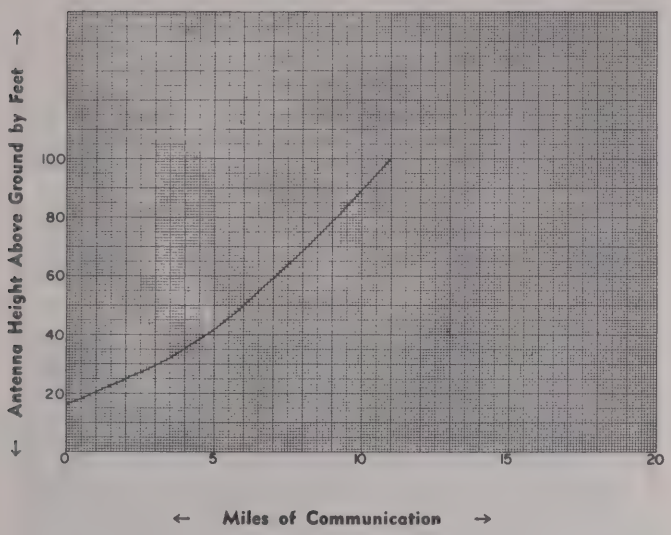
By including a transmit-receive relay (TR-1) in this transceiver, the many advantages of "Push-to-talk" operation and maximum transfer of energy to and from the antenna are afforded the operator at no extra cost. The circuit consists of a half-wave rectifier which receives its AC voltage from a 12 volt secondary winding on the power transformer. The rectifier is followed by an RC filter network whose output is connected in series with one end of the relay coil. The other end of the relay coil is connected through the microphone socket to the microphone switch button. This completes the 12 volt DC relay circuit to ground and the relay performs the following switching functions:

RECEIVE- In this position the relay is not energized and the antenna is connected to the receiver input, B+ voltages are furnished to the receiver section and one side of the speaker is grounded.

TRANSMIT- The relay is energized and the antenna is switched to the transmitter output circuit, B+ voltages are furnished to the screen and plate circuits of V6A, V9, V11, V12 and final amplifier V10. The speaker voice coil is removed from ground.

Ground Plane or Coax Antenna For 15 Microvolts at Receiver

Chart #3



Note how the distance increases with increase height of the antenna for a given installation as in Chart 1. If a direction antenna is used as in Chart 2 you can see how the distance is further increased, however, this reduces the area covered since the Yagi Antenna is quite directional.

Charts 1 and 2 are based on a 2 microvolt signal at the receiver. This signal will not be sufficient for many city areas where high levels of noise exist. Chart 3 considers the coverage for 15 microvolts at the receiver and is more practical for general city use.

When the Citizen frequencies are open to skywave transmission, signals from distant stations will be strong enough to over power weak direct signals. When one is considering communication he should understand that for 100% contact he should base the calculations on 15 microvolts or more.

In mobile communication dead spots will be found at various points as well as locations giving excellent signals. These points should be noted and contacts made from the best possible locations. Vehicle noise and electrical interference will greatly reduce your communicating distance.

ELIMINATE YOUR MOBILE "NOISE GENERATORS"

Now that low cost TWO-WAY radio communication is available to everyone with the opening of the eleven meter band for Citizen use the number of mobile installations will probably exceed the number of base, or control, stations by a factor of 5 to 1 within the near future. It is estimated there are now over 160,000 citizen band mobile installations and approximately 45,000 base, or control, stations in operation. Proper installation and necessary steps towards the elimination of electrical, and mechanical, interference inherent in all motor vehicles is of prime importance if distances of three miles or more are desired to be covered.

For short range coverage the simple installation of a "radio condenser" on the generator and the "interference suppressor" installed in the top of the distributor, or coil, is usually sufficient noise suppression. But when maximum distances of three or more miles must be covered, great pains must be taken and all known means of noise suppression must be used. Different makes and models of vehicles will require different means of noise suppression. Some models only the very simple, others will need the "all out" method.

As there are numerous "generators" of radio interference in every motor vehicle the elimination of one source may not be noticeable as it's noise level may be below one you have not located so the proper way to approach your "noise" problem is by a systematic process of first suppressing all known offenders, namely the generator, voltage regulator, distributor and spark plugs.

We will explain throughout this article what is considered to be the proper vehicle noise suppression methods. The volume of noise you can, or will, tolerate in your receiver will depend upon the amount of suppression applied. Few installations will require the "all out" method and the user must decide when he is satisfied.

The purpose for eliminating your own "noise generators" is the fact that your receiver's automatic volume control (AVC) will react to these random noise pulses the same as though a strong station was tuned-in and will cut the receiver's sensitivity way down which will eliminate the weak stations you normally wish to copy. There's an old saying "if you can't hear them, you can't work them."

Let's start our "noise elimination" with the generator and voltage regulator. The generator is the item that causes the whine as the speed of the motor is increased. It is very easily detected by speeding up the engine and then cutting the ignition off. The instant the switch is turned off ONLY the generator and voltage regulator can cause the noise as all other "noise generators" are eliminated when the switch is off EXCEPT the generator as it is still in operation and is still trying to charge the battery through the voltage regulator. Even though it will operate only a few seconds after the switch is off this is time enough for you to hear the terrific amount of noise it is generating. As the speed of the engine decreases the whine will decrease in unison.

ANTENNAE AND THEIR SELECTION

The most common antennae for citizen use are the Ground Plane and Coaxial for base use and the Vertical Whip for mobile use. The Yagi multi-element beam antenna can be used to great advantage where point-to-point communication is required rather than non-directional coverage from the base station. Any antenna with a directional gain will effectively increase the radiated power of the transmitter as well as the received signal applied to the receiver.

It is best to purchase a good commercially built antenna rather than attempt to construct your own. Good commercial antennae have low SWR (standing wave ratio) which is a merit of the radiation efficiency. With home constructed antennae it is sometimes difficult to effect a good match between the antenna and the transmitter causing considerable power to be lost in the system. An antenna should have an SWR of no more than 2:1.

Some power will be lost in the transmission line and therefore long runs should use the larger RG-8U cable. This cable has a lower loss per foot than the smaller RG-58/U. Both types have a characteristic impedance of 53 ohms. Loss per 100 feet at 27 megacycles is 1 db for RG-8/U and 2 db for RG-58/U. For short runs the RG-58/U cable is more easily handled.

Most of the antennae are available in two grades. The lower priced standard grade will not be as mechanically strong as the commercial grade. Electrically both grades are usually about equal. Where ice loads, wind, and salt air are a factor it will be cheaper in the long run to purchase the better antenna.

For extremely short range communication (less than a mile) the base loaded case whip antenna works very well. With two units using case whips, the signals will become quite weak after a block or two and poor squelch operation will be encountered. The outside antenna is by far the best choice and should be mounted as high as practical and still be within F.C.C. regulations. [Paragraph 19.25(c)]. In brief, the F.C.C. limits antenna height to no more than 20 feet above an existing structure or not to extend above the top of the radiating element on an existing tower. Remember the Yagi type antenna is usually mounted in a horizontal position. This type antenna must be used with another antenna mounted in the same plane. If the Yagi is to be used to communicate with mobile units using a whip antenna, the Yagi should be mounted in a vertical plane. A little thought in antenna installation will greatly improve your coverage.

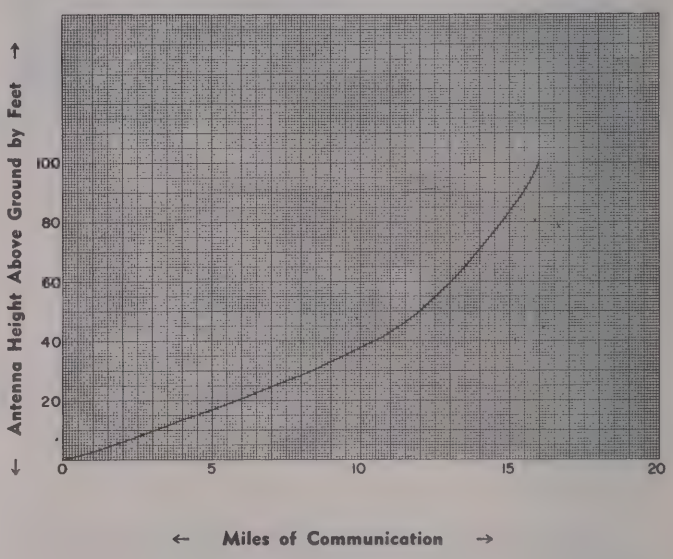
DISTANCE vs ANTENNA

The direct coverage you are able to obtain using Citizen Equipment in the 27 megacycle band will depend a great deal upon the antenna. We shall speak of direct coverage rather than skywave coverage wherein you may communicate 500 to 2000 miles at various times.

The F.C.C. has intended the Citizen use to be for short range communication and all installations should be calculated on this basis. The following charts consider a base station antenna mounted on a mast with the calculated range to a mobile unit using a standard 108" whip. Remember that the antenna may be mounted on an existing structure or mast [reference F.C.C. 19.24(c)].

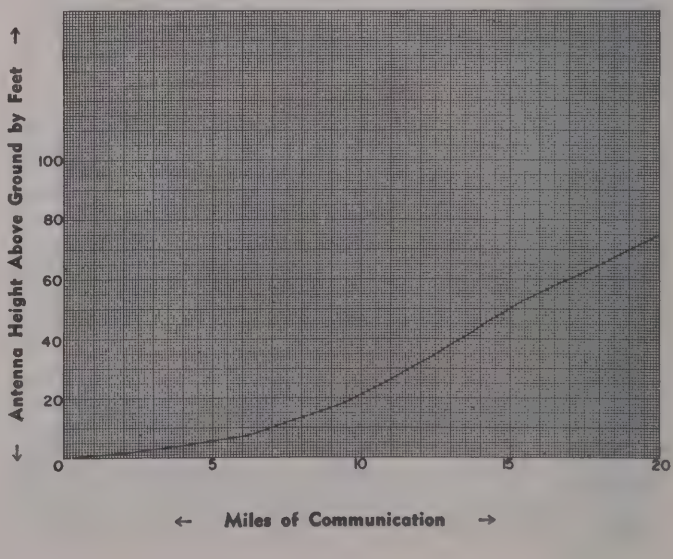
Ground Plane or Coax Antenna For 2 Microvolts at Receiver

Chart #1



Yagi Antenna Mounted Vertical For 2 Microvolts at Receiver

Chart #2



Practically all vehicle manufacturers cable the two leads from the voltage regulator to the generator in a harness with other wires. It is recommended that both of these wires be run in **separate** tinned copper braid. Just disconnect the present wires from the generator and the other end of them at the voltage regulator's "A" and "F" terminals. They can be cut-off where they enter the harness or just taped down out of the way.

A Sprague 48P18 coaxial capacitor, or a similar .5 mfd coaxial capacitor, should be installed directly ON the generator and the lead from the condenser to the battery armature terminal of the generator must be as short as possible. In fact a length of one inch is sometimes too long. A .001 mfd mica capacitor should now be installed from the same battery terminal to the frame of the generator, here again lead length is extremely important and they should be no longer than one-quarter inch. Be sure to remove paint and grease on the generator where the capacitor is bolted as a "good" ground at this point is necessary.

Dress the cable from the coaxial capacitor on the generator against the body of the car. Use speed clips to keep in place or run through presently installed cable clamps. This cable is usually the longest "noise generator" we must suppress and it is preferred to shield this wire in tinned copper braid. The end of the braid must be soldered directly to the coaxial capacitor's body. Be sure to use size #12 copper stranded wire when making-up this new lead. Connect a new cable to the generators' "F" (field) terminal and run this lead in a tinned copper braid shield and dress it along side the battery lead. This new lead may be of size #16 copper stranded wire.

The voltage regulator is next and the "job" from here on is usually easy compared to the one just completed. Remove the cover from the voltage regulator and clean off any paint that may insulate the cover from the frame. Check the mounting screws and be sure the regulator is being grounded directly to the firewall. If necessary remove and clean away any paint so you may secure a "perfect" ground connection.

Use two 48P3 of 48P5 Sprague coaxial capacitors or similar .1 to .5 mfd coaxial capacitors and install at the "A" and "B" terminals of the regulator. The capacitors metal body must be grounded directly to the firewall. This can be easily accomplished by using a piece of cadimun plated metal about 4" x 4" bent to a 90° angle. Drill two holes for the capacitors and two holes to pass sheet metal screws to bolt to the firewall. Attach the capacitors to the angle with screws and nuts and **also** solder. Locate the assembly so the lead from each capacitor to the "A" and "B" regulator terminals are extremely short. Be sure to clean the paint from the firewall so the bracket will make a good solid ground connection. Attach the cable from the generator's "F" terminal to the voltage regulator's "F" terminal. Connect a .002 mfd capacitor and a 4 ohm resistor, in series, from this point to ground. Again, lead length is important and the overall length of the capacitor-resistor combination must be as short as possible. Attach the lead from the generator's armature terminal to the coaxial capacitor connected to the voltage regulator's "A" terminal. The shielding braid on these leads must be grounded to the capacitor bracket or to the firewall by soldering or with the use of washers and sheet metal screws. Attach the "B" battery lead to the coaxial capacitor connected to the "B" terminal of the voltage regulator. This is the lead coming through the firewall and usually goes direct to the battery charging indicator on the vehicles dash panel.

The next superb "noise generators" of them all are the spark plugs. But here we have available to us years of research for only a few dollars. Just go to your local auto supply store and purchase a complete set of AUTO-LITE RESISTOR spark plugs that are direct replacements for your particular brand and model of vehicle. CAUTION: We own no stock in Auto-Lite, but please accept no "substitute" as some **resistor** plugs will actually increase your noise problem. Be patient, if your dealer does not stock your size just ask him to get them for you. When installing the new plugs be sure to have the gap properly set.

After **properly** installing the "recommended" suppression to these trouble makers you should be able to drive comfortably and communicate with stations you never heard before with your engine running. However, in most cases this is only the beginning of the job in order for you to say that you have a good mobile installation.

If you have been checking your "noise elimination" progress as you complete each step we know you will be extremely pleased with your work. But from here on each suppression job will not be very noticeable until you hit the one big joker that's causing a lot of trouble. The little "noise generators" will be obscured by this one and wouldn't have showed up until it was eliminated. All-in-all the little ones can really add up and must be taken care of in due time.

Have your distributor checked to see that the capacitor across the breaker points has the proper capacitance and the points are properly set. If the vehicle has been driven 30,000 to 40,000 miles or more it is recommended that the distributor cap and rotor be replaced. This will usually not only reduce the ignition noise, but also improve the overall performance of the engine. At the same time have the timing checked and properly adjusted.

When purchasing your new AUTO-LITE resistor spark plugs also buy enough 4,000 ohm-per-foot ignition cable to make up a new wiring harness from the distributor to the spark plugs. Be sure that the new terminals (ferrules) are installed whereby they make **good** contact with the center conductor of the new cable. It is preferred that the ferrules be soldered rather than crimped on as there is danger of a poor contact causing another "noise generator" to appear.

Check your ignition wiring by shorting out each plug, in turn, while listening to the receiver. Any reduction in the noise level will usually indicate that the ferrules are not making good contact in the distributor head, or the ferrule and center conductor should be soldered.

Install a 10,000 ohm carbon suppressor in the distributor's center terminal and make up a new lead to run to the coil. Here again be sure the ferrules are soldered and are making a "tight" connection inside the coil and distributor. A new lead is recommended here as any breaks what-so-ever in the ignition system's wiring insulation could be a source of "ignition noise." With very short leads connect a .001 mfd disc ceramic capacitor from the coil's battery terminal to the coil's case.

Bonding braid should now be run from the fire wall, coil, and the distributor to the engine. Use as short a piece of braid as possible in each case. If the ground lead of the battery is attached to the fire wall it should be removed and attached to the starter mounting bolt. The power cable ground lead for your transceiver should also be connected at this same point. Usually the hot and ground leads from the battery go direct to the starter's

solenoid which is mounted on the starter and this is a good place to connect the transceiver's power cable. CAUTION: Remove the hot cable from the battery before making connections to the starter as there is danger of the hot battery cable getting loose and shorting out the battery or even starting a fire.

Connect a short piece of bonding braid across each engine hood hinge. NOTE: The hood will act as a shield to help keep the engine noise inside the engine compartment and away from your antenna. Next connect a short length of bonding braid across each trunk lid hinge, front of the engine to the frame, exhaust tail pipes to the frame, and a piece of wire braid from the air cleaner to the fire wall. It is very important that we caution you to be sure that you clean away all paint, grease or insulation material when installing the grounding braid as **good,** low resistance, ground connections must be made.

Noisy tires should be treated with an anti-static powder, brake shoes grounded to the backup plates with bonding braid and static collectors installed inside the front wheel grease retainer cups. Heat and oil indicator sending units on the engine must be by-passed with .1 to .5 mfd capacitors, again using very short leads. All instrument panel gauges and accessories should be by-passed using .5 mfd capacitors. Heater and defroster motors, electric windshield wiper motors and any other accessory motors by-passed with a .25 to .5 mfd capacitor. The gasoline sending unit mounted on the gasoline tank must be by-passed with a .1 to .5 mfd capacitor. An inspection plate is usually provided in the trunk compartment over the tank.

For the person who desires the "ultimate" in mobile "noise elimination" there are available for some vehicles marine and aviation spark plugs that could be used and the complete ignition system shielded by using these plugs and making metal boxes to enclose the distributor and coil, and shielding all wiring associated with the ignition system. By having the ignition system **completely** shielded most of the "suppression" can be eliminated and the normal high engine performance will be maintained.

You should set aside a week-end for your "noise elimination" project and have all necessary parts and tools available. You may visit your local two-way radio communications company and secure most of the parts required in kits furnished by some manufacturers of two-way radios. The other parts required are available from radio parts supply and auto parts supply firms.

Lay out your line-of-attack and as each "noise generator" is suppressed it should be noted and checked by listening to the receiver or noting the receiver's "S" meter indication before and after the suppression. This indicates the noise level entering the receiver that is being picked-up by the antenna. To check the noise level entering the receiver by the antenna connecting cable disconnect the cable where it connects to the antenna and short the cable's terminals. If noise is still noticeable it will be necessary to re-route the cable under the vehicle and up through the fire wall to the transceiver. Check the noise level entering the receiver through the power cable by disconnecting the antenna connecting cable at the receiver. All noticeable noise in the receiver is now being picked-up by the power cable and fed to the receiver. This can usually be eliminated by installing a Sprague 48P3 feed-thru coaxial capacitor on the fire wall and the hot battery lead from the transceiver connected through the capacitor to the battery terminal.

We sincerely hope that we have been of some help to you and assure you that when you finish your "noise elimination" project you will consider yourself an "**expert.**" But just as a parting reminder, remember that all of those cars along side of you, up front, behind and the ones passing have not been through the "elimination" process and it will be up to your receiver's built-in noise limiter to cut **their** noises down to a listening level that is bearable.

Reprinted by International Crystal Mfg. Co., Inc.
From Class "D" Citizens Band Radio 1960 Call Book

WIRING POWER PLUG FOR MODEL 750

The 3-way power supply may be operated from any one of 5 different power systems; 115 VAC; 6 VDC positive ground, 6 VDC negative ground, 12 VDC positive ground, 12 VDC negative ground. Depending upon voltage to be used, connect the jumper wires to the plug as indicated below.

Remove the cover from the power plug by removing the two retainer pins and then separating cover and base. The sketches below are of the connection side of the plug base. Use the #18 buss wire supplied to make jumpers. Where jumpers cross and there is danger of a short, use a length of the insulating sleeving over the wire.

Part #150-174

115 VAC

115 VAC to pins 1 and 4
Jumper pins 2 and 3
Jumper pins 13 and 18

6 VDC Neg. Gnd.

+6VDC to RMO
-6VDC Gnd. to pin 15 brown and pin 1 red
Jumper pins 11 to 12 to 14 to 15 to 18
Jumper pins 2 to 5 to 17
Jumper pins 7 to 8
Jumper pins 6 to 9
Jumper pins 10 to 16

6VDC Pos. Gnd.

-6VDC to RMO
+6VDC Gnd. to pin 15 red/1 br.
Jumper pins 9 to 12 to 15 to 18
Jumper pins 6 to 11 to 14
Jumper pins 2 to 5 to 17
Jumper pins 7 to 8
Jumper pins 10 to 16

12 VDC Neg. Gnd.

+12 VDC to RMO
-12 VDC Gnd. to pin 15 brown and to pin 1 red
Jumper pins 10 to 14 to 15
Jumper pins 7 to 8 to 16
Jumper pins 2 to 5 to 18
Jumper pins 6 to 9

12VDC Pos. Gnd.

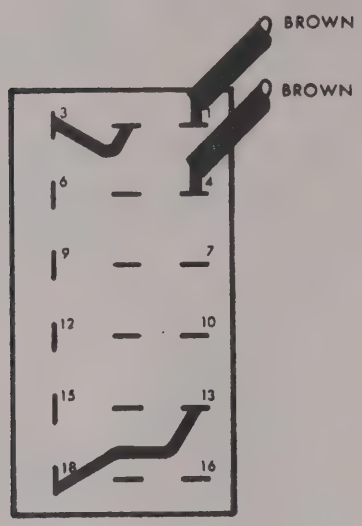
-12 VDC to RMO
+12VDC Gnd. to pin 15 red/1 br.
Jumper pins 6 to 10 to 14
Jumper pins 7 to 8 to 16
Jumper pins 2 to 5 to 18
Jumper pins 9 to 15

NOTE: Battery voltage connects to the RMO console unit, the two cables from the transceiver plug both go to ground.

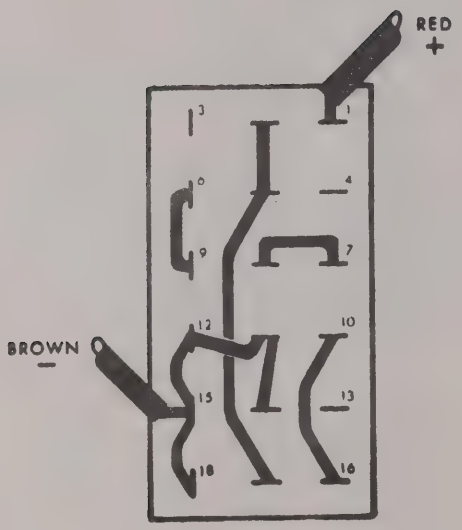
POWER PLUG WIRING

(ALL VIEWS FROM BACK OF PLUG)

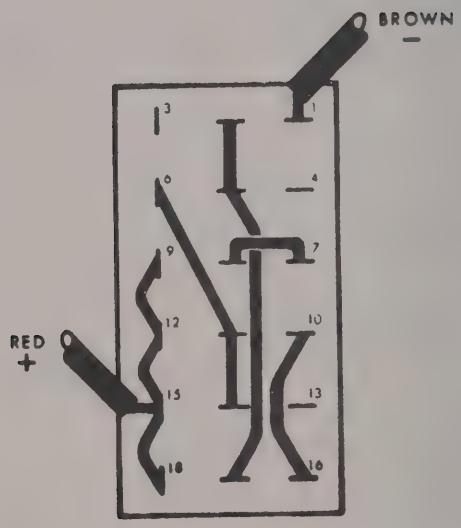
115 VAC



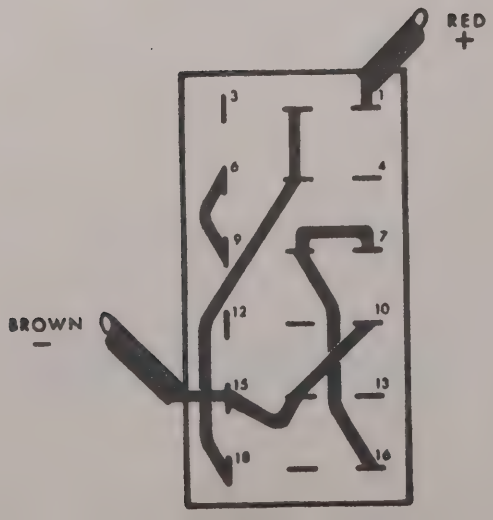
6 VDC Neg Gnd



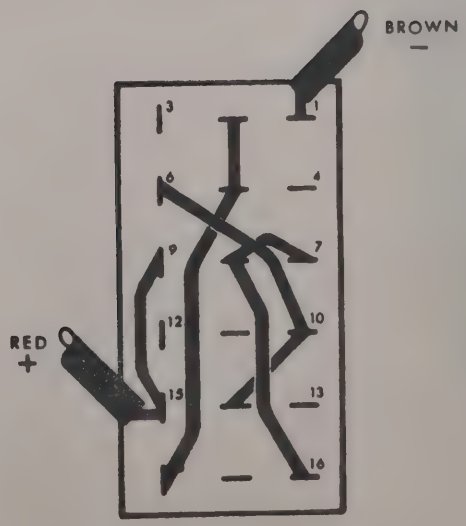
6 VDC Pos Gnd



12 VDC Neg Gnd



12 VDC Pos Gnd



SECTION III

INSTALLATION OF RMO CONSOLE

If the RMO Unit is to be used in a mobile installation fasten the RMO cover to Mobile Mount Section A as shown in Fig. 9. Section B is then fastened to the bottom section of the dashboard in the vehicle.

The transceiver is usually placed in the trunk compartment of the vehicle.

After the units are mounted it will be necessary to connect the antenna transmission line to the antenna connector on the transceiver.

For 115 VAC operation use the regular 115 VAC power cable for your transceiver. Interconnect the RMO Unit and the transceiver with the two 15' black wires.

These wires are fed through the grommet on the front panel and one wire is inserted into the red terminal bushing and the other in the black terminal bushing.

The other end of these wires are fed through the grommet in the back panel of the RMO Unit and inserted into the black and red terminal bushings as in the transceiver. It is unnecessary to observe polarity.

For 6 VDC operation use the regular 6 V power cable for your transceiver and connect both the red and brown wires to the car body.

Feed both black wires through the grommet on the transceiver front panel and insert both into the red terminal bushing. The other ends of these wires are inserted into the red terminal bushing on the RMO Unit and another wire is inserted into the black terminal bushing. The other end of this wire is connected to the hot side of the battery.

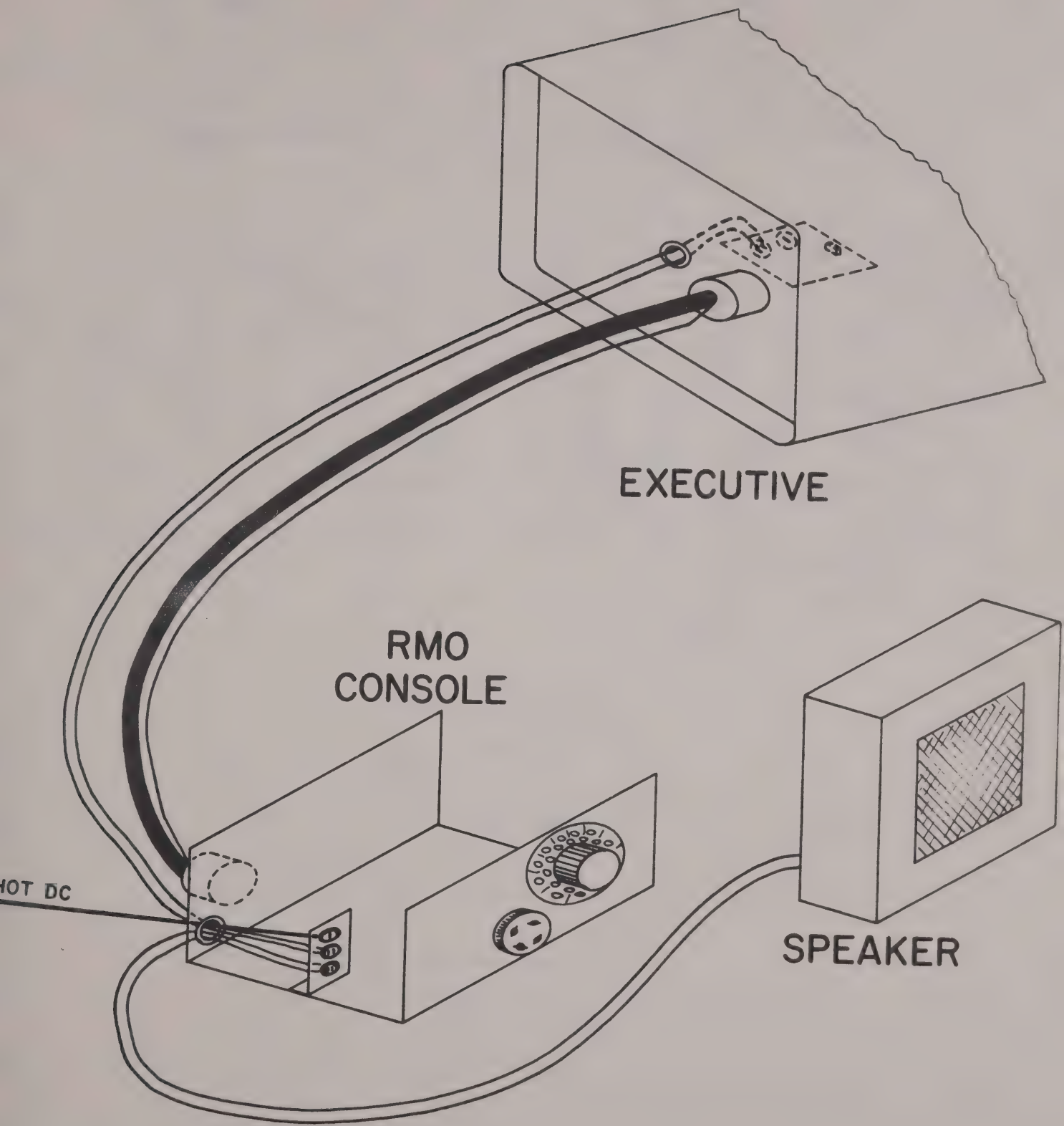
For 12 VDC operation connect the same as described for 6 V operation except use the 12 VDC power cable for your transceiver. The routing of these wires can follow the same routing as the main interconnecting power cable.

Due to the size of the power cable the easiest way to route this cable from the front seat area to the trunk compartment is from the RMO unit to the firewall, down the firewall to the left side of the drive line hump under the floor mat along the edge next to door sill and into the trunk compartment.

After the unit is installed and all interconnections are made slip the RMO unit out of the case and connect speaker to terminals in green terminal bushing in RMO unit. Turn unit on, switch channel selector to desired channel and set RMO volume control half open. Set volume control on Executive for desired listening level. Peak the antenna coil on the converter board for best signal to noise ratio. This completes installation of RMO unit.

SHORT FORM OPERATING CHART

FUNCTION	CONTROL or CONNECTOR
Connect Antenna	ANT connector on transceiver rear panel
Connect power cord of desired voltage	POWER connector on transceiver rear panel
Connect 11 pin cable	Between RMO and transceiver
Connect two jumper wires	Between RMO and transceiver terminal bushings
Connect Hot DC jumper	Between RMO terminal bushing and hot DC voltage
Connect Speaker	To RMO green terminal bushings
Turn Squelch off	SQUELCH on RMO front panel
Turn set power ON and set volume level	VOLUME on RMO front panel
Connect microphone	MIC connector on RMO front panel
Set HI-LO switch to desired range	HI-LO on RMO front panel LO- 1 through 12 HI- 13 through 23
Transmit by pushing button on microphone	Push-to-talk button on microphone


EXECUTIVE
RMO
CONSOLE
HOT DC
SPEAKER

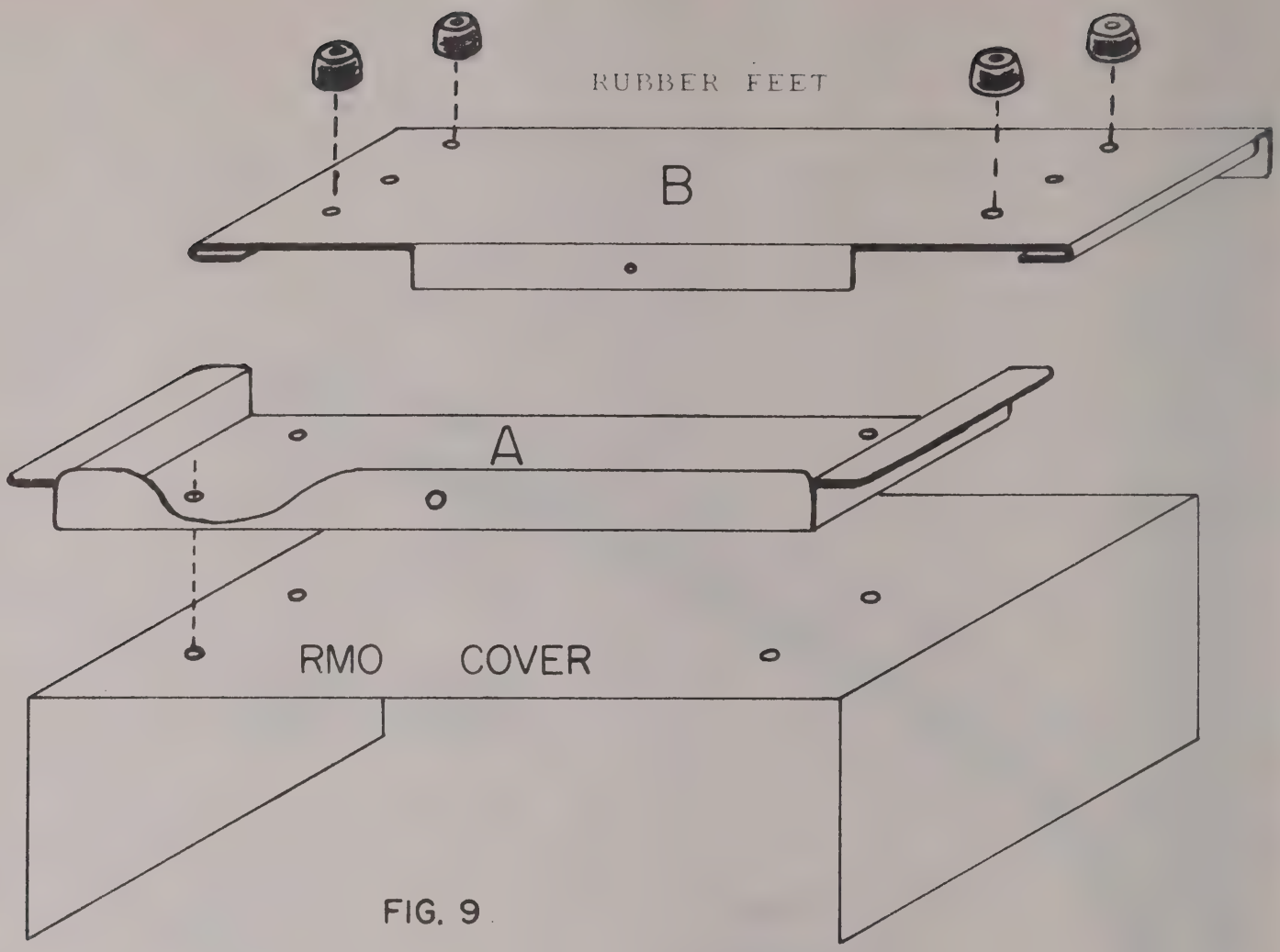
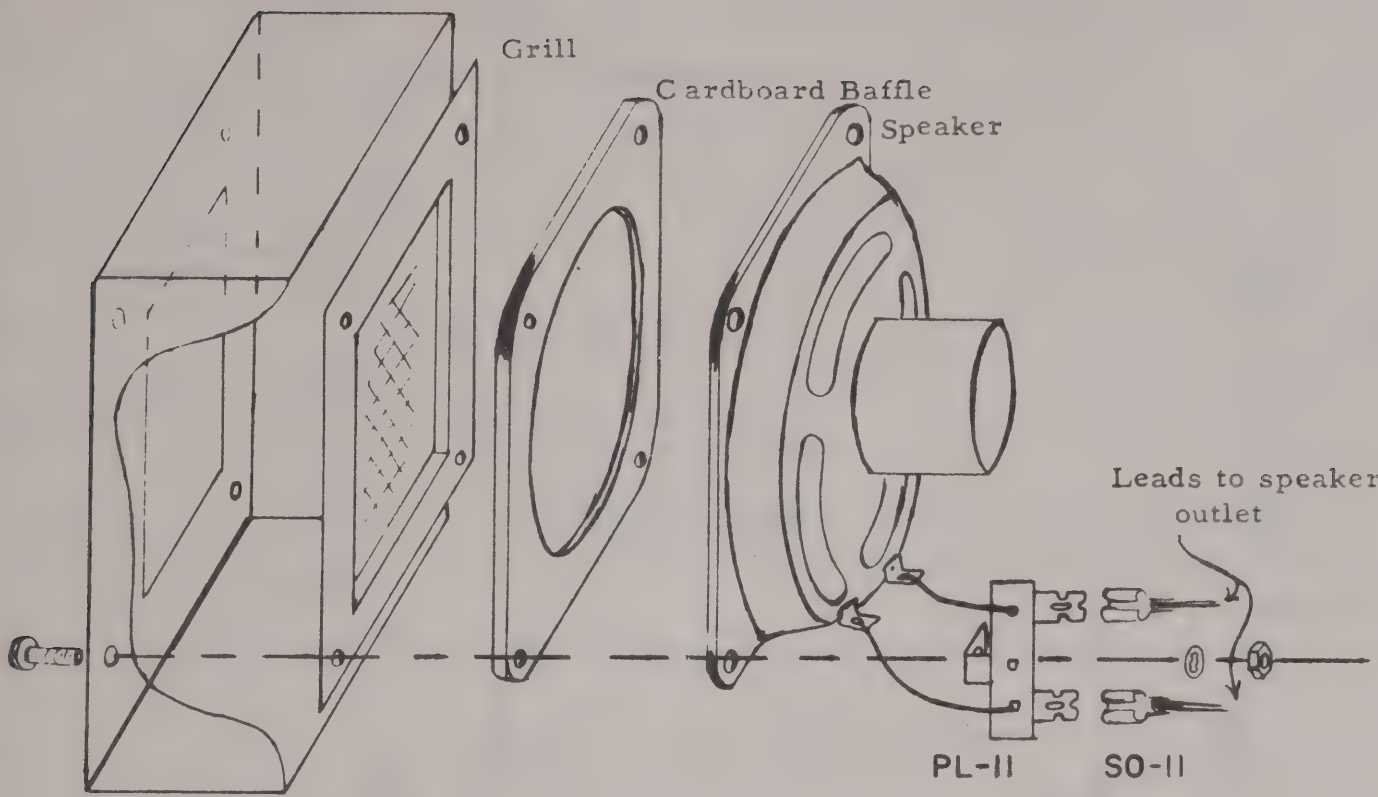
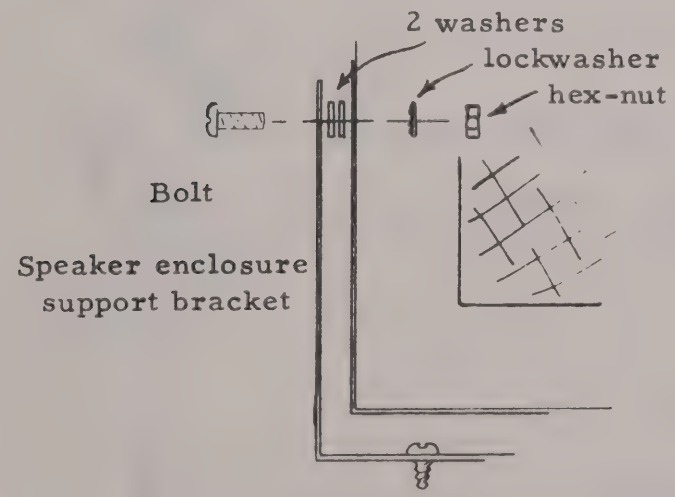
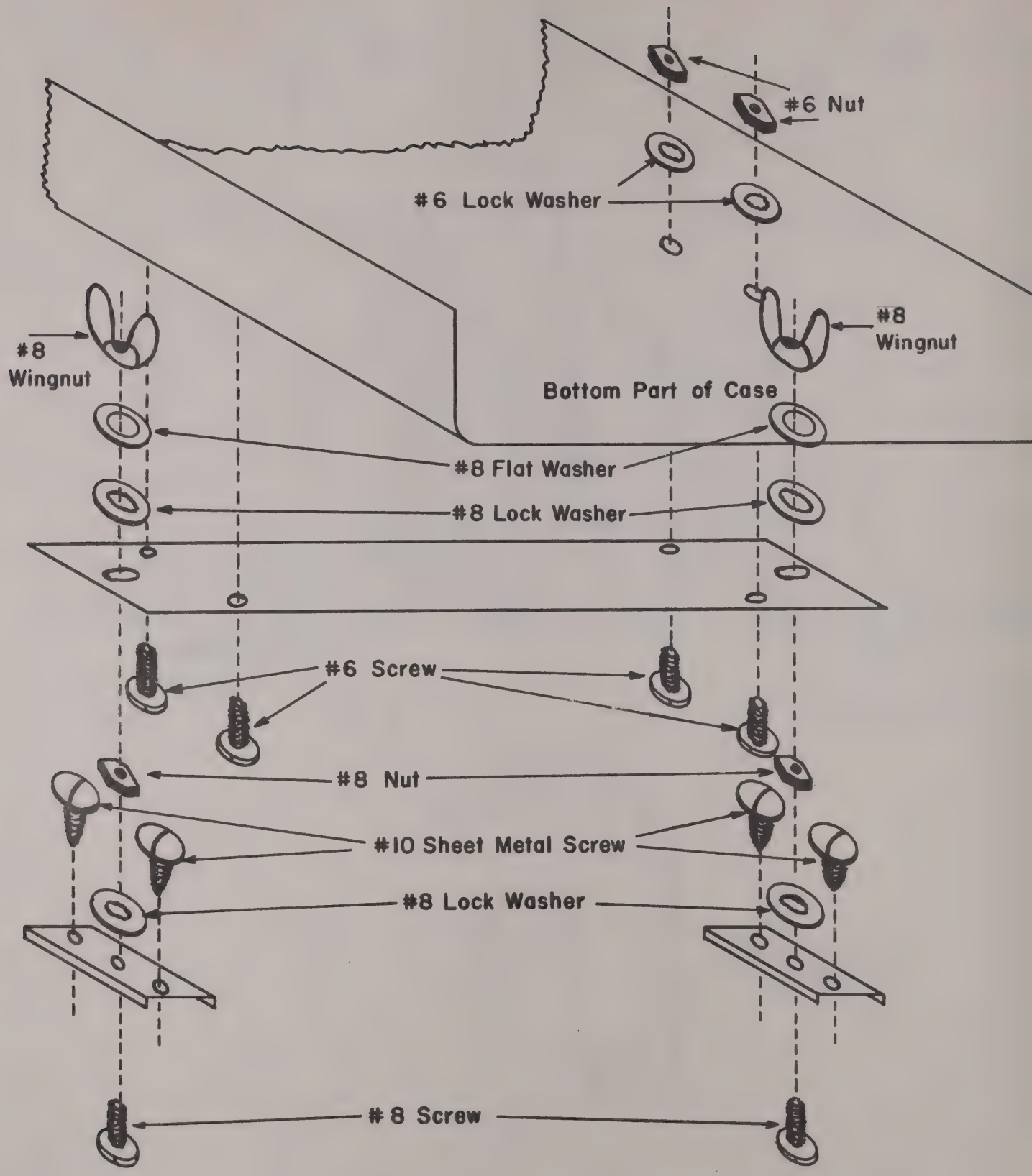
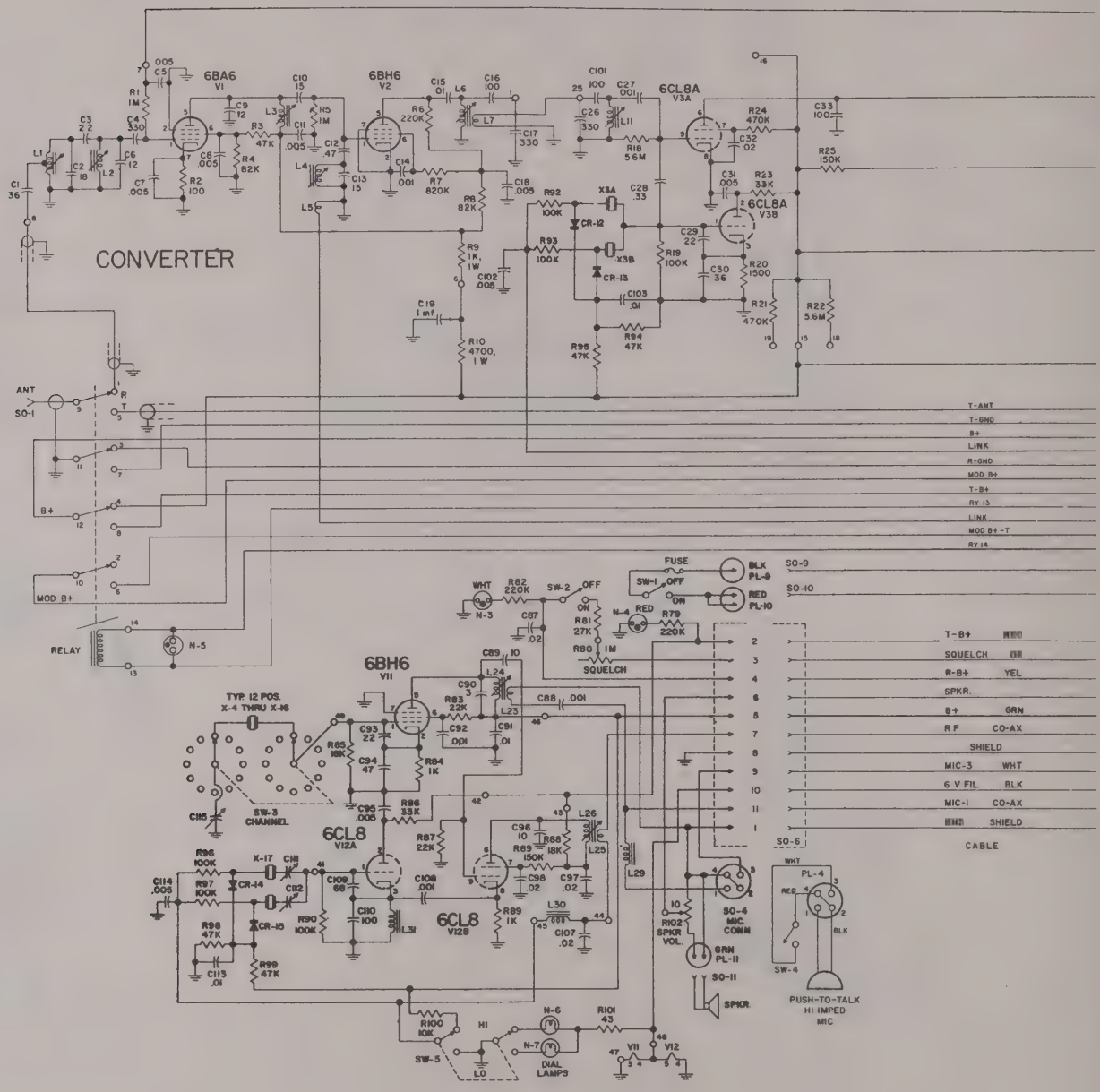


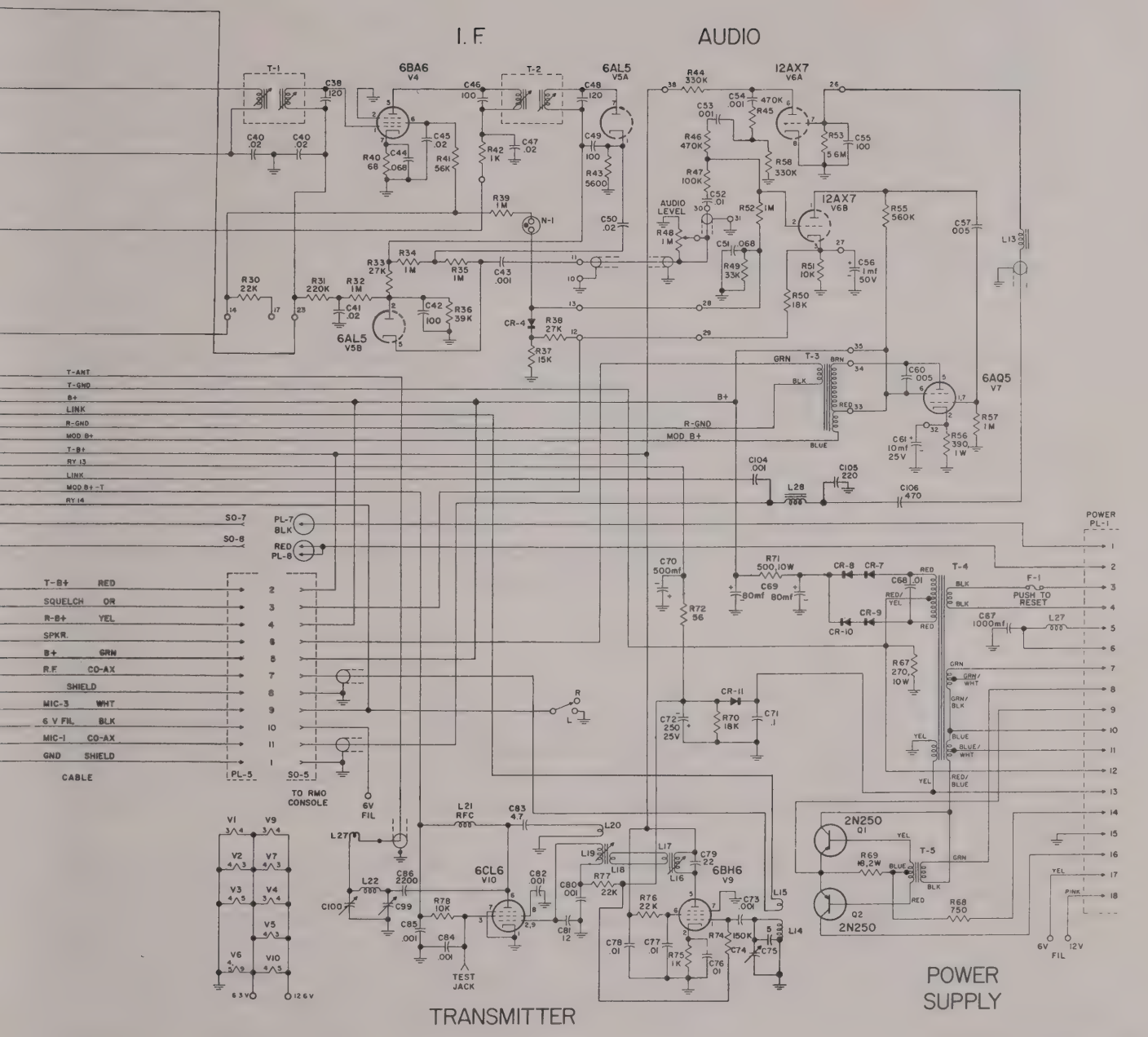
FIG. 9


Grill
Cardboard Baffle
Speaker
Leads to speaker outlet
PL-11
SO-11


2 washers
lockwasher
hex-nut
Bolt
Speaker enclosure support bracket


#6 Nut
#6 Lock Washer
#8
Wingnut
#8
Wingnut
Bottom Part of Case
#8 Flat Washer
#8 Lock Washer
#6 Screw
#8 Nut
#10 Sheet Metal Screw
#8 Lock Washer
#8 Screw


CONVERTER
6BA6 V1
6BH6 V2
6CL8A V3A
6CL8A V3B
6BH6 V11
6CL8 V12A
6CL8 V12B
ANT
SO-1
RELAY
N-5
MOD B+
B+
SQUELCH
TYP. 12 POS. X-4 THRU X-16
SW-3 CHANNEL
FUSE
SW-1
SW-2
N-3
N-4
PL-9
PL-10
SO-9
SO-10
SO-6
SO-4 MIC. CONN.
SPKR VOL.
SPKR
SO-11
PL-4
SW-4
PUSH-TO-TALK HI IMPED MIC
SW-5
N-6
N-7
DIAL LAMPS
T-ANT
T-GND
B+
LINK
R-GND
MOD B+
T-B+
RY 13
LINK
MOD B+-T
RY 14
T-B+
SQUELCH
R-B+
SPKR.
B+
R F
SHIELD
MIC-3
6 V FIL.
MIC-1
SHIELD
CABLE



EXECUTIVE	
MODEL	750
DRAWN BY: [illegible]	CHECKED BY: [illegible]
DATE: 11/8/63	DATE: 11/8/63
INTERNATIONAL CRYSTAL MFG. CO., INC.	
18 N LEE, OKLAHOMA CITY, OKLAHOMA	

WARRANTY REGISTRATION

Model _____ Date Purchased _____ Serial No. _____

Purchased from _____

Owner's Name _____

Owner's Address _____

City _____ State _____

Owner's Call _____

10-153

WARRANTY

International Crystal Manufacturing Company warrants the parts and tubes in any International Citizen Transceiver to be free from defects in workmanship and material arising from normal usage. Its obligation under this warranty is limited to replacing any such parts or tubes of the receiver which, after regular installation and under normal usage and service, shall be returned within ninety (90) days from the date of original purchase of the set to the authorized dealer from whom the purchase was made and which shall be found to have been thus defective in accordance with the policies established by International Crystal Manufacturing Company.

The obligation of International Crystal Manufacturing Company is limited to making replacement parts available to the purchaser, and does not include either the making or the furnishing of any labor in connection with the installation of such replacement parts nor does it include responsibility for any transportation expense.

International Crystal Manufacturing Company assumes no liability and shall not be liable in any respect for failure to perform or delay in performing its obligations with respect to the above warranty if such failure or delay results, directly or indirectly, from any preference, priority or allocation order issued by the Government or because of any other act of the Government, or by war, conditions of war, inadequate transportation facilities, conditions of weather, acts of God, strikes, lockouts, Governmental controls, or Internationals reasonable requirements for manufacturing purposes, or any cause beyond its control or occurring without its fault, whether the same kind or not.

CONDITIONS AND EXCLUSIONS

This warranty is expressly in lieu of all other agreements and warranties expressed or implied, and International Crystal does not authorize any person to assume for it the obligations contained in this warranty and neither assumes nor authorized any representative or other person to assume for it any other liability in connection with such International units or parts or tubes thereof.

The warranty herein extends only to the original consumer purchaser and is not assignable or transferable and shall not apply to any transceiver or parts or tubes thereof which have been repaired or replaced by anyone else other than an authorized International dealer, service contractor or distributor, or which have been subject to alteration, misuse, negligence or accident, or to the parts or tubes of any receiver which have had the serial number or name altered, defaced or removed.

International Crystal Manufacturing Company is under no obligation to extend this warranty to any unit for which an International registration card has not been completed and mailed to the Company within fifteen (15) days after date of purchase.

FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D.C.

87048
April 15, 1960

UNAUTHORIZED PRACTICES IN BUSINESS AND CITIZENS RADIO SERVICES

An increasing number of reports have reached the Commission concerning the practice of some suppliers of Business and Citizens Radio Services equipment to advise their customers that such equipment may be operated by them prior to the issuance of a radio station license by the Commission. In some instances, sellers have "assigned" radio station call signs to purchasers in conjunction with the sale of radio apparatus and, in a few such cases, these call signs have been identical with those authorized to be used by the manufacturer or seller of the equipment.

A radio station license is required for the use or operation of a radio station in the Business and Citizens Radio Services by Section 301 of the Communications Act. With the exception of certain low power equipment described in Part 15 of the Commission's Rules, the operation of any radio transmission apparatus by a person other than the one to whom the Commission has issued a radio station license is illegal and may result in the imposition of severe criminal sanctions (one year in prison or $10,000 fine, or both) or in the institution of other enforcement action by the Commission.

Under Section 310 (b) of the Communications Act, the prior consent of the Commission is required for the transfer or assignment of any radio station license or the rights granted thereunder. One who fails to observe this provision by the purported transfer of his operating authority subjects himself to possible license revocation and such other enforcement action as the Commission may consider warranted by the circumstances. The denomination of such unlawful activities as "equipment demonstrations" does not render them less illicit.

This matter is being brought to the attention of manufacturers, distributors and retail vendors of Business and Citizens Radio Service communication equipment in the belief that they share the Commission's conviction that the orderly development of these dynamic special radio services is hampered by the above-described practices and that one who engages in such practices, in addition to the possibility of having drastic enforcement action instituted against him, may be sacrificing for the benefit of an immediate sale the long range good will of a misadvised customer.

It is requested that the foregoing be brough to the attention of the personnel in all organizations concerned in any way with the sale, maintenance or use of Business or Citizens Radio Stations in order that a prompt cessation of unlicensed operation of radio stations in these services may be brought about.

-FCC-

F.C.C. RULES & REGULATIONS

PART 19.72 POSTING OF STATION LICENSE

(b) The current authorization of each citizens radio station operated as a mobile station or operated at temporary locations may be retained in the permanent records of the station and need not be posted; However, an executed Transmitter Identification Card (FCC Form 452-C, Revised) shall be affixed to each transmitter which is operated as a mobile station or is operated at temporary locations, and to the control equipment of each such transmitter in every case where such transmitter is not in view from the location from which the station in controlled.

(c) The following information shall be entered on each Transmitter Identification Card (FCC Form 452-C, Revised) which is used for transmitter or station identification in accordance with the foregoing:

(1) Name of the station licensee;
(2) Station call sign assigned by the Commission (see 19.62);
(3) Exact location or locations of the permanent station records;
(4) Frequency or frequencies upon which the assoicated transmitter is adjusted to operate; and
(5) Signature of the licensee.